

with Sachs, and is lecturing to a large class on Vegetable Physiology. Next year he will start the first practical course of botany, and, being unable to induce his college to provide apparatus for a laboratory, intends to furnish it at his own expense. Among other lectures in natural science Prof. Dewar's on Physical Chemistry are taking high rank. It is to be noted that Mr. Apjohn, the late lamented Praelector of Chemistry at Caius College, was to have received a fellowship this term by special vote of the whole of the fellows. The praelectorship is to be continued mostly in its old form, but it is worthy of note that the prosecution of original research is put prominently among the duties of the office, as well as the instruction of students from the University generally. There are nearly a score of candidates, including such well-known names as Mr. W. Noel Hartley, Dr. J. T. Bottomley, and Dr. Dittmar.

Prof. Clerk Maxwell greatly interested the Philosophical Society at its last meeting by an account of Henry Cavendish's unpublished writings and experiments on electricity. He was not generally known to have done much electrical work, and his papers were long in the hands of Sir W. Snow Harris, who is declared by Prof. Maxwell, after careful examination, to have made no use of Cavendish's work without full and adequate acknowledgment. These writings are left in a form quite fitted for publication, and will greatly advance the reputation of the great philosopher. His exactness, his candour, his grasp of the subject, his notable achievements with the small variety of instruments available in his time, were fully shown by the examples cited to the Society. Yet these were less than his remarkable insight into electrical laws, his correct conception of potential, his ideas of investigating the total charges of bodies, and the resistance of electrolytes. Prof. Maxwell thought that nobody had ever possessed so large and various a collection of condensers of known capacity as Cavendish, but his family taciturnity prevented his merits from being fully known. He trained himself to be his own galvanometer, and the general value of his results is remarkable when compared with those obtained by modern instruments.

In regard to university reform, it appears that in some colleges at least there is a danger of the non-resident fellows, who form the largest proportion of the governing body under the act, endeavouring to maintain at a very high number the fellowships to which no duties are attached; of course every such fellowship diminishes the funds available for definite association with the progress of research and education. Some men hold very strongly to the "start in life" theory of fellowships; viz., that they ought to receive three hundred a year for a number of years in order that they may gain three thousand a year in a profession the more speedily.

GLASGOW.—Mr. Gladstone has been elected Lord Rector of Glasgow University in succession to the Earl of Beaconsfield.

BERLIN.—The well-known botanist, Prof. Sachs, of Würzburg, has received a very flattering call to Berlin. Neither pains nor money seem to be spared by the Prussian Government in attracting to the capital the foremost talent of Germany; and certainly in this choice of a successor to Alexander Braun no change of policy is shown.

GÖTTINGEN.—The sum of 50,000 marks has recently been appropriated for the erection of a phyto-physiological institute in the Botanical Gardens.

GIESSEN.—In consequence of the late discussions excited by Prof. Memmisen's articles on the Ph.D. examinations in Germany, the University of Giessen has issued an announcement stating that for the future no faculty can bestow the title of Doctor, except on the basis of a thesis and oral examination.

DORPAT.—The winter attendance at the university is 853, of whom but seven are non-Russian.

BRUNSWICK.—On October 16 interesting ceremonies took place at the opening of the magnificent new buildings of the Carolo-Wilhelminum Polytechnic, in which representatives of the Government, and delegates from all the great German polytechnics, took part. The new edifices are of great extent, and richly equipped with all possible adjuncts for modern technical education, so that this well-known institution will be able to maintain its well-earned reputation. The Carolo-Wilhelminum is the oldest polytechnic in Germany, having been founded in 1745, and the list of its students embraces many distinguished names, such as Gauss, the mathematician, Christopher Codrington, the English commander at the naval victory of Navarino, &c.

SOCIETIES AND ACADEMIES

LONDON

Chemical Society, November 15.—Dr. Gladstone in the chair.—The following communications were made:—First report to the Chemical Society on some points in chemical dynamics, by Dr. Wright and Mr. Luff. An elaborate series of experiments was made to find out the temperatures at which the actions of carbonic oxide, hydrogen, and free amorphous carbon on oxide of iron or oxide of copper are first perceptible. The authors find that this temperature varies with the physical condition of the oxide used, that hydrogen acts, on a given oxide, at a lower temperature than carbon and carbonic oxide, at a lower temperature than hydrogen, and that a given reducing agent begins to act on copper oxide at a lower temperature than on iron oxide.—On the chemistry of cocoa butter, Part I.; two new fatty acids, by C. T. Kingzett. The first acid is a low acid of the series, $C_nH_{2n}O_2$, having the formula $C_{12}H_{24}O_2$, i.e., lauric acid, but it melts at $57^{\circ}5$. The second acid is a high acid having the formula $C_{64}H_{128}O_2$, crystallising in microscopic needles or granules, melts at $72^{\circ}2$, and at a high temperature distils apparently unchanged. The author proposes for it the name of theobromic acid. It is pointed out that the usual statement in books, "that cocoa butter yields almost exclusively stearic acid" is entirely incorrect.—The third paper was on the influence exerted by time and mass on certain reactions in which insoluble salts are produced, by Mr. M. P. Muir. The author has taken solutions containing known quantities of calcium chloride and potassium or sodium carbonate mixed, allowed to stand for a certain number of minutes, and then estimated the quantity of calcium carbonate formed. He has arrived at the following conclusions:—That the greater portion of the chemical change takes place during the first five minutes; the reaction then decreases in rapidity. The relative masses of the salts exert an important influence. Thus if the mass of alkaline carbonate be four times that required, the action is completed in five minutes, but if an equivalent quantity only be present the action is not finished in forty-six hours. Potassium carbonate yields more calcium carbonate in a given time than sodium carbonate. An increase of temperature increases, whilst dilution, especially with solutions of potassium or sodium chloride, diminishes the rapidity of the action. Some experiments are given on the action of solutions of calcium sulphate and sodium chloride.

Entomological Society, November 7.—Prof. Westwood, president, in the chair.—Mr. McLachlan exhibited ten of the thirteen species of Lepidoptera collected by Capt. Feilden and Mr. Hart in Grinnell Land, between 78° and 83° N. lat., during the recent Arctic Expedition, and made some remarks upon the general insects of the Arctic Regions.—The Rev. A. Eaton also made some observations upon the same subject.—Mr. Meldola exhibited a five-winged specimen of *Gonepteryx rhamni*, taken in Norfolk by Mr. John Woodgate; likewise a gynandromorphic specimen of *Pieris brassicae*, caught in Oxfordshire by Mr. J. B. Watson. The right half of the latter insect was female and the left half male.—Mr. H. Goss exhibited a gynandromorphic specimen of *G. rhamni*, captured in Sussex; in this insect also the right side was female and the left side male.—Mr. J. W. Douglas exhibited a specimen of *Polyphylla fulva*, Linn., which had flown on to a steamer at Antwerp, and been thus brought to this country. Mr. Douglas also exhibited a specimen of the rare *Tettigometra impressopunctata* and one of *Typhlocyba debilis*, both taken on Sanderstead Downs; and likewise, for comparison, an example of *T. tenerima*.—Mr. W. C. Boyd exhibited a larva of *Pieris rapae* attacked by *Microgaster*.—The president read notes on exotic Coleoptera, and exhibited specimens of *Calometopus Nyassae*, *Amblyodus Nicaraguae* and drawings of other species.—Prof. Westwood also remarked upon an Indian *Mantis (Gongylus gongylodes)* which had been recently described by Dr. Anderson in the *Proceedings* of the Asiatic Society of Bengal for August, 1877, as being a simulator of a flower to a remarkable degree of perfection.—Mr. Wood-Mason also made remarks upon the same subject and upon stridulating organs in crustaceans with reference to a letter on this subject by Mr. Saville Kent in this journal (vol. xvii. p. 11). Mr. Wood-Mason likewise announced the discovery of a stridulating apparatus in a *Phasma*.—Sir Sydney Saunders read a note on the specific identity of the Hampstead *Atypus*. Mr. F. Enoch exhibited and made remarks upon a male and female of this spider.—The following papers were read:—Descriptions of new species of the coleop-

terous genus, *Callirhipis* (*Rhipidoceridae*), in the British Museum, by C. O. Waterhouse.—Descriptions of a new genus and two new species of *Sphingidae*, with remarks on the family generally, by A. G. Butler.—Descriptions of *Halticinae*, by J. S. Baly.—Descriptions of new species of *Cleridae*, with notes on the genera and corrections of synonymy, by the Rev. H. S. Gorham.

Royal Astronomical Society, November 9.—Dr. Huggins, F.R.S., in the chair.—A very large number of papers were presented.—Lord Lindsay was called upon to read Mr. Gill's report upon the expedition to Ascension to obtain the parallax of Mars, from which it appeared that in spite of meteorological difficulties and many causes of anxiety most satisfactory results had been obtained, and Mr. Gill had gone up a mountain to recruit his health.—Several important mathematical papers were then read; one by the Astronomer-Royal on the solar parallax, as deduced from telescopic observations of the transit of Venus, 1874.—Next a paper by Prof. Adams on the motion of the moon's node, and a paper by Mr. Neilson on three small inequalities in the mean motion of the earth, and a small inequality in the mean motion of Mars. These were followed by three observational papers on the recent opposition of Mars; one by the Astronomer-Royal, read by Mr. Christie, giving the summary of what was seen at Greenwich both with the telescope and spectroscope; the next by Mr. N. E. Green, giving an account of his expedition to Madeira and what he saw of Mars with a fine 13 inch reflector. This paper was accompanied by a series of beautiful drawings of the planet by the author. The third paper, on Mars, was by Mr. John Brett, being a discussion of a series of telescopic observations made in Cornwall, the purport of which was to show that the generally received hypothesis of the physical condition of Mars was altogether fallacious, neither the snows nor the seas having any foundation in fact. This paper was also illustrated by a series of drawings.—Then followed a paper by Lord Lindsay, on a new form of spectroscope, and the meeting adjourned.

Anthropological Institute, November 13.—Dr. John Evans, F.R.S., president, in the chair.—The Rev. T. A. Bennett and F. V. Dickins were elected members.—An interesting series of casts of skulls made of papier-mâché were exhibited, and a special vote of thanks was ordered to be sent to Prof. Bogdanow, of Moscow, by whom they were presented to the Institute.—Major-Gen. A. Lane Fox, F.R.S., exhibited some flint flakes from Egypt, and a note from Capt. R. F. Burton was read on the same.—The director then read a paper by Mr. H. H. Howorth, F.S.A., on the spread of the Slaves: Part I., the Croats.—This was followed by a paper on the Castilieri d'Istria, by Capt. R. F. Burton, H.M.'s Consul at Trieste.—Mr. Hyde Clarke, the President, Major-Gen. A. Lane Fox, and Mr. Moggridge took part in the discussions.

Institution of Civil Engineers, November 13.—Mr. George Robert Stephenson, president, in the chair.—The paper read was a review of the progress of steam shipping during the last quarter of a century, by Mr. Alfred Holt, M. Inst. C.E., of Liverpool.

PARIS

Academy of Sciences, November 12.—M. Peligot in the chair.—M. Faye presented the volume of the *Connaissance des Temps* for 1879.—On some applications of elliptic functions (continued), by M. Hermite.—Résumé of a history of matter (fourth article) by M. Chevreul. This relates to the views of Lavoisier, Stahl, Scheele, Cavendish, and Priestley.—Observations on the principle of maximum work and on the spontaneous decomposition of hydrated bioxide of barium, by M. Berthelot.—On the limits of etherification, by M. Berthelot. In experimenting on etherification sixteen years ago he put aside a number of mixtures to be kept a considerable time, in order to ascertain the limit of the reactions produced at ordinary temperatures. The mixtures consisted of acetic acid and alcohol (equal equivalents), acetic acid and glycerine, tartaric acid and alcohol, valeric acid and alcohol. He has now examined these. The general laws of etherification are confirmed, and especially the identity of the limits of combinations between acids and alcohols, from ordinary temperatures up to 260°.—On the order of appearance of the first vessels in the shoots of some Leguminosæ (second part), by M. Trécul.—The Academy elected a commission to present a list of candidates for the vacancy among the Foreign Associates, caused by the death of M. von Baer.—On the numeration of globules of milk for the analysis of woman's milk, by M. Bouchut,

A drop of milk is mixed with 100 drops of slightly saline water (distilled). A drop of the mixture is placed under the microscope, whose eye-piece is divided into squares; the number of globules in each square is counted, and the average taken; from this may be deduced the number in one cubic millimetre. The globules were thus counted in milk of 158 nurses, before, during, and after suckling. The average of globules is about 1,026,000 per cubic millimetre of milk, or a hundred and two millions six hundred millions per litre; but between 800,000 and one million per cubic millimetre, the milk is considered of good quality. In one table are given the density and the quantity of butter corresponding to given numbers of globules of cow's milk.—New formulae for the study of the motion of a plane figure, by M. Haton de la Goupilliére.—On the migration of the puceron of the cornel tree and its reproduction, by M. Lichtenstein. This puceron comes from the roots of graminee, and returns to them. Its mode of reproduction is that termed by the author *anthogenesis*.—Observations on the subject of a recent communication from M. Fabre, by M. Millardet. The secretary announced a new biennial prize, founded by M. Maujean.—Discovery of a small planet at the Observatory of Paris, by M. Paul Henry.—Discovery of a small planet at the Observatory of Pola, by M. Palisa.—Observations of planets 125 and 176 made at the Paris Observatory (equatorial of the garden), by MM. Paul and Prosper Henry.—New stellar systems, by M. Flammarion.—On the equation with partial derivatives of the third order expressing that the problem of geodesic lines, considered as a problem of mechanics, supposes an algebraic integral of the third degree, by M. Lévy.—On the evolution of red corpuscles in the blood of oviparous vertebrates, by M. Hayem. The red corpuscles proceed from a peculiar colourless element, which from the first phases of development is distinct from the white corpuscles; the name of *hematoblast* is given it. The white corpuscles are foreign to the formation of the red, both in oviparous vertebrates and in the higher animals; but whereas in the latter the red corpuscles of new formation are coloured, whatever their minuteness, in the oviparous, the embryonic corpuscles are at first quite without haemoglobin.—On the spots and crevices of pears, by M. Prillieux. These are due to the growth of a small parasitic champignon.—On the semi-diurnal variations of the barometer, by M. De Parville. He thinks it improbable that aqueous vapour has a preponderating influence in these variations.—On the quantities of heat liberated in mixtures of sulphuric acid and water, by M. Maamené. Sulphuric acid recently heated does not liberate, with water, the same quantity of heat as the same acid kept several months. This phenomenon, denoted as a tempering of liquids, seems to him a source of error in researches on thermo-chemistry not hitherto considered.

CONTENTS

	PAGE
DANISH GREENLAND	57
OUR BOOK SHELF :—	
Harrison's "Sketch of the Geology of Leicestershire and Rutland"	58
LETTERS TO THE EDITOR :—	
Expected High Tides — EDWARD ROBERTS	58
Rainfall in the Temperate Zone in Connection with the Sun-spot Cycle.—DR. W. W. HUNTER	59
Contribution to the Sun-spot Theory of Rainfall.—DR. E. BONAVIA	61
The Radiometer and its Lessons.—PROF. OSBORNE REYNOLDS; DR. WILLIAM B. CARPENTER, F.R.S.	61
Fluid Films — C. TOMLINSON, F.R.S.	62
Tuckey and Stanley.—The Yallala Rapids on the Congo.—DR. J. RAB	62
The Future of our British Flora.—A. CRAIG-CHRISTIE	62
Selective Discrimination of Insects.—HENRY O. FORBES	62
The Earth-worm in Relation to the Fertility of the Soil.—GEO. H. PHIPPS	62
Smell and Hearing in Moths — E. H. K	62
Carnivorous Plants.—FRANCISCO GINEZ	63
OUR ASTRONOMICAL COLUMN :—	
Minor Planets	63
The Comet of 1672	63
MR. DARWIN AT CAMBRIDGE	64
INTERNATIONAL GEOLOGICAL CONGRESS	65
THE MODERN TELESCOPE. By J. NORMAN LOCKYER, F.R.S. (With Illustrations)	66
ZOOLOGICAL GARDENS	68
NOTES	69
THE LIBERTY OF SCIENCE IN THE MODERN STATE. By PROF. RUDOLF VIRCHOW	72
UNIVERSITY AND EDUCATIONAL INTELLIGENCE	74
SOCIETIES AND ACADEMIES	75